



April 13, 2017

## AR LABORATORY NETWORK: TESTING OVERVIEW

### Targeted Surveillance for Emerging Resistance Threats

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#### PUBLIC HEALTH IMPORTANCE OF TESTING.

Reference laboratory testing of emerging or changing AR threats is critical to understanding prevalence, transmission, and prevention. This activity aims to establish a network of laboratories that will submit isolates for CDC-directed and coordinated public health assessments. The focus of this targeted surveillance will change, as new and emerging threats are detected and previously identified threats become better characterized. This targeted surveillance will begin with a focus on MDR *Acinetobacter* and colistin-resistant Enterobacteriaceae.

*Acinetobacter* species can be difficult to treat, especially strains which are carbapenem-resistant, because they are resistant to nearly all available antibiotics. Little is known of the prevalence and resistance profile of carbapenem-resistant *Acinetobacter* spp. Increasing lab capacity to test and characterize these bacteria will enhance understanding of resistance trends, allow detection of emerging trends, and increase the amount of actionable data to help inform infection control strategies.

Colistin is one of the few remaining treatments for drug-resistant Enterobacteriaceae infections. However, a new resistance gene, *mcr-1*, has emerged causing some Enterobacteriaceae bacteria, particularly species such as *Escherichia coli* and *Klebsiella pneumoniae*, to become resistant to colistin. Increasing lab capacity to screen and detect *mcr-1* resistance will help detect emergence and outbreaks and inform surveillance and prevention measures.

#### SAMPLE COLLECTION AND SUBMISSION.

***Acinetobacter*** isolate submission should include isolates that are resistant to imipenem, meropenem, or doripenem.

For surveillance of *mcr-1*, isolate submission should be targeted to ***E. coli* and *K. pneumoniae*** susceptible to carbapenems, but resistant to third-generation cephalosporins (cefotaxime, ceftriaxone, ceftazidime, and cefepime). If possible, suspected isolates should also test positive for extended-spectrum  $\beta$ -lactamase (ESBL).

Isolates should be sent to the following address:

**Delaware Public Health Laboratory , ATTN: Debra Rutledge  
30 Sunnyside Rd  
Smyrna, DE 19777  
(302) 223-1520**

#### DESCRIPTION OF TESTING.

Isolate testing is performed by the **Maryland Dept of Health and Mental Hygiene** to identify or confirm bacterial species, phenotypically characterize antimicrobial susceptibility, and identify resistance genes. The testing workflow involves the following:

- Species identification or confirmation by mass spectrometry or commercially-available automated instrument testing (e.g., VITEK2, Phoenix, MIDI, etc.)
- Antimicrobial susceptibility testing to confirm phenotypic detection carbapenem resistance using disk diffusion, Etest, or broth microdilution methods; colistin susceptibility evaluated only by Etest.
- Phenotypic methods to detect carbapenemase and ESBL production (e.g., CIM or CarbaNP assays)
- Molecular detection of carbapenemase and *mcr-1* resistance genes by validated PCR-based assays